CYCLE TIMER

FOR DUAL CHAMBER BLAST MACHINES

O. M. 25729

DATE OF ISSUE: 04/12/12
REVISION:

⚠ WARNING

Do not proceed with these instructions* until you have READ the orange cover of this MANUAL and YOU UNDERSTAND its contents.

These WARNINGS are included for the health and safety of the operator and those in the immediate vicinity.

***If you are using a Clemco Distributor Maintenance and Parts Guide, refer to the orange warnings insert preceding the Index before continuing with the enclosed instructions.**

Electronic files include a Preface containing the same important information as the orange cover.

One Cable Car Dr.
Washington, MO 63090
Phone (636) 239-4300
Fax (800) 726-7559
Email: info@clemcoindustries.com
www.clemcoindustries.com

1.0 INTRODUCTION

1.1 Scope

1.1.1 These instructions cover field assembly, operation, maintenance, troubleshooting, and replacement parts for dual chamber (continuous-action) cycle timer. For operation of the blast machine, refer to the blast machine owner's manual. Which may be one of the following Clemco dual chamber blast machines:

O.M. 06154 Dual Chamber Blast Machine with Manual Controls.

O.M. 23063 Dual Chamber Blast Machine with Remote Controls.

1.2 Safety Alerts

1.2.1 Clemco uses safety alert signal words, based on ANSI Z535.4-1998, to alert the user of a potentially hazardous situation that may be encountered while operating this equipment. ANSI's definitions of the signal words are as follows:

This is the safety alert symbol. It is used to alert the user of this equipment of potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

CAUTION

Caution used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

⚠ CAUTION

Caution indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

⚠ WARNING

Warning indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ DANGER

Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

1.3 Description

1.3.1 Components of cycle timer kit are shown in Figure 1. The kit includes:

One control panel, which includes 12 VDC or 120-VAC timer and solenoid. The timers are adjustable, and control the ON Time (when the upper chamber is under pressure) and OFF Time (when the upper chamber is not under pressure). A toggle switch on the cover enables and disables the timer.

One inlet valve: Includes control-line filter. The valve controls air into the top chamber.

Two abrasive traps: These traps carryout abrasive as the top chamber depressurizes, and protect the outlet valves from excessive abrasive erosion.

Two diaphragm outlet valves: They rapidly exhaust air from the top chamber when the timer times-out to depressurize the top chamber.

All interconnecting control hoses.

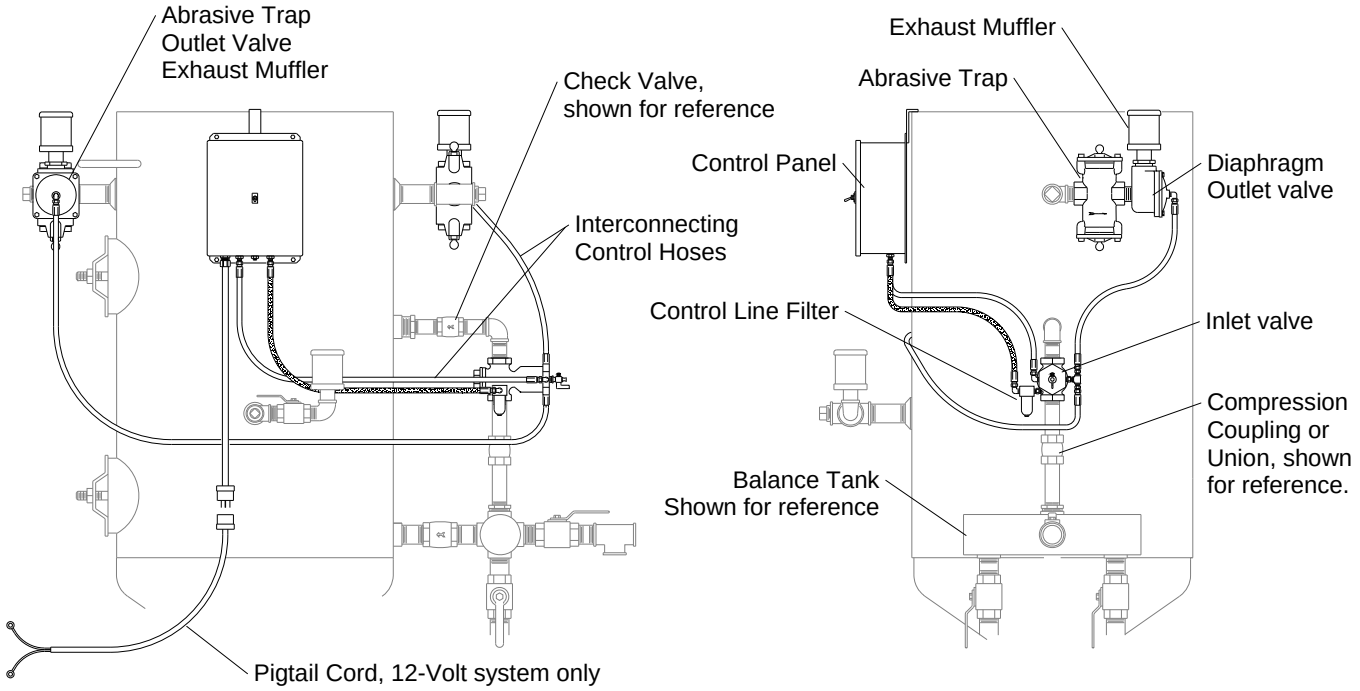
1.3.2 The cycle timer controls pressurization and depressurization of the upper chamber of dual chamber blast machines. This enables the machine to continue blasting while the upper chamber automatically cycles at regular timed intervals. The upper chamber automatically refills with abrasive if the machine is placed under a hopper.

1.3.3 Dual chambers enable refilling of the upper chamber with abrasive while blasting continues from the lower chamber. Pressurization and depressurization of the lower chamber is done independently of the cycle timer operation. Refer to the blast machine owner's manual for operation of the blast machine.

1.4 Theory of Operation

1.4.1 The lower chamber always contains abrasive and supplies abrasive to the metering valves. When the lower chamber is under pressure and the upper chamber is not, the upper chamber is refilled with abrasive. When the upper chamber pressurizes, and pressure in both chambers equalizes, the lower pop-up valve drops, transferring abrasive from the upper to lower chamber.

1.4.2 When the upper chamber depressurizes, the lower pop-up valve rises to seal the lower chamber (blasting continues from the lower chamber) while the upper pop-up drops and allows refilling of the upper chamber.



The illustration shows a dual outlet machine. Setup is the same for single outlet machines except the balance tank is replaced with a cross.

Figure 1

1.4.3 The cycle timer automatically performs the operation. When the timer is in the OFF mode, the inlet valve is closed and the diaphragm outlet valves are open. The upper chamber is depressurized and can be filled with abrasive.

1.4.4 When the timer goes into ON mode, the inlet valve opens permitting air to enter the upper chamber; the outlet valves close, keeping air in the upper chamber so it pressurizes.

1.4.5 When air in the upper and lower chamber equalizes, the lower chamber pop-up drops, transferring abrasive from the upper chamber to the lower chamber while blasting continues. When the timer goes into OFF mode the inlet valve closes as the outlet valves open depressurizing the upper chamber, starting the cycle again.

2.0 INSTALLATION
Refer to Figure 1

⚠ WARNING

Failure to observe the following before performing any maintenance could cause serious injury or death from the sudden release of compressed air.

- **Depressurize the blast machine.**
- **Lockout and tagout the compressed air supply.**
- **Bleed the air supply line to the blast machine.**

2.1 If there is an existing, manual inlet valve on the upper chamber piping, it may be removed or left on as a service valve. If it is left on, it must remain open during operation.

2.2 Install inlet valve and outlet valve assemblies as shown in Figure 1. The directional arrow on the inlet valve must face up toward the upper chamber. The directional arrow on the abrasive traps must point away from the blast machine.

2.3 Place the control panel at a convenient location. It may be mounted on the rim of the blast machine, using the bracket provided or be mounted close by.

2.4 Attach interconnecting hoses as follows:

1. Attach one leg of the 3-foot twinline hose to the filter on the inlet valve (shown as shaded hose in Figure 1). Connect the other end to fitting marked "Filtered Air In" at the bottom of the panel.
2. Attach the other leg of the 3-foot twinline hose between the one of the fittings at the top of the inlet valve and the fitting marked "Control Air Out" at the bottom of the panel.
3. Connect the 5-foot hose between one of the fittings on the inlet valve and the farthest outlet valve.
4. Connect the 18-inch hose between the remaining fitting at the top of the inlet valve and the outlet valve closest to the inlet valve.
5. Do not connect any hose to the "Exhaust Port" fitting at the bottom of the panel.

2.5 Make sure the panel's toggle switch is OFF, and then connect power to the panel. Make sure the voltage matches that of the panel.

2.6 Functional Tests

2.6.1 Attach an air line to the blast machine inlet, and pressurize the lower chamber.

2.6.2 Close the petcock on the cycle timer inlet valve.

2.6.3 Flip control panel toggle switch ON.

2.6.4 Set the timer OFF time to a low setting, approximately one minute.

2.6.5 Set the timer ON time to about two minutes.

2.6.6 The timer should pressurize the top chamber for about one minute and depressurize it for about two minutes. While the top chamber is under pressure, check the piping fittings, abrasive traps, outlet valves and control hoses for leaks.

3.0 OPERATION

3.1 Add enough abrasive to fill the lower chamber.

3.2 Place the cycle timer toggle to OFF and pressurize the lower chamber.

3.3 Close the safety petcock on the inlet valve. The petcock should be kept closed unless the machine or controls are being serviced. The safety petcock prevents control pressure from operating the top chamber.

3.4 Start blasting and time how long it takes to run out of abrasive.

3.5 Set timer sub-range ON time and OFF time to operate within the durations required. Refer to the timer operating instructions. Initially set the sub-range of ON and OFF time to operate between one and ten minutes.

3.6 Set the timer ON time to run slightly less than the time it take to empty the lower chamber.

3.7 Set the timer OFF time to slightly less than the ON time.

3.8 Test the operation under actual blast conditions. If the machine runs out of abrasive, adjust the cycle time accordingly.

4.0 MAINTENANCE

4.1 Daily

4.1.1 Empty the abrasive trap and clean the abrasive trap screen at least twice a day, more often if trap is full or screen is blocked.

4.1.2 Inspect outlet valves while top chamber is pressurized; make sure valves seal. If valve leaks, replace diaphragm.

4.2 Monthly

4.2.1 Remove the hose from the panel's control "air out port" at the inlet valve. Place a drop or two of light weight tool oil in the inlet valve fitting.

5.0 TROUBLESHOOTING

5.1 Machine runs out of abrasive before the top chamber cycles to refill.

5.1.1 Make sure storage hopper contains ample abrasive.

5.1.2 Decrease ON time to shorten the blast time from the lower chamber, or if the upper chamber is not fully filling, increase OFF time to allow more time for the upper chamber to fill.

5.1.3 Make sure metering valve is correctly adjusted to avoid excessive abrasive consumption.

5.2 Timer does not cycle

5.2.1 Make sure the toggle is positioned to ON, and power is supplied to the panel.

5.2.2 Make sure timer is set correctly and that the timer sub-range is set correctly.

2.2.3 Make sure the safety petcock on the inlet valve is closed. An open petcock will prevent the valves from operating.

5.2.4 Check all control lines, fittings, and outlet valves for leaks. Any leak will cause the system to malfunction.

5.3 Top Chamber Does Not Depressurize

5.3.1 Check abrasive trap screens for blockage. Clean screens and traps twice daily.

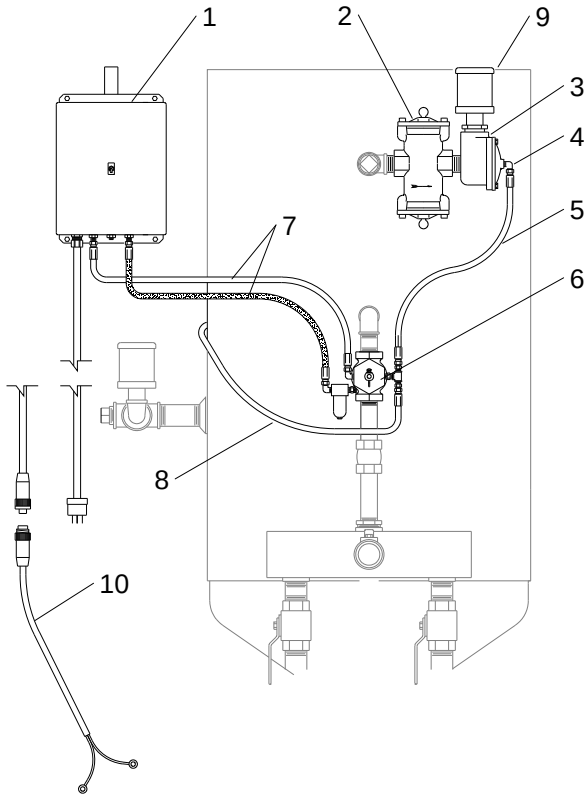
6.0 REPLACEMENT PARTS

6.1 Cycle Timer Systems

120-Volt Cycle timer system 02207
12-Volt Cycle timer system 03439

6.2 System Replacement Parts, Figure 2

Item	Description	Stock No.
1.	Control Panel with mounting bracket	
	120-Volt AC	02205
	12-Volt DC	06147
2.	Abrasive trap	02011
3.	Outlet valve, 1" diaphragm	03371
4.	Elbow, 1/4" NPT adaptor	02513
5.	Hose, 3/16" x 18-inch, coupled	02454
6.	Inlet valve, CA/CAD cycle timer w/filter	04111
7.	Hose, 3-ft Twinline, coupled	02240
8.	Hose, 3/16" x 5-foot, coupled	03083
9.	Muffler, exhaust	05068
10.	Pigtail, 12-Volt supply cord used on 12-volt systems only	10831



Some items are rotated for clarity

Figure 2

6.3 Control Panel, Figure 3

Item	Description	Stock No.
(-)	Control Panel with mounting bracket	
	120-Volt AC	02205
	12-Volt DC	06147
1.	Timer, on/off cycle	
	120-Volt AC	08805
	12-Volt DC	08758
2.	Valve, NC air	
	120-Volt AC	03425
	12-Volt DC	03426
3.	Adaptor, elbow 1/4 NPT x 1/4 tube	03428
4.	Adaptor, straight, 1/4 NPT x 1/4 tube	03429
5.	Adaptor, straight, 1/8 NPT x 1/4 tube	03430
6.	Tubing, 1/4” OD, specify ft. required	03427
7.	Adaptor, 1/4 NPT fem. Bulkhead	03432
8.	Bushing, 1/4 NPT x 1/8 NPT, brass	02010
9.	Switch, toggle	04184
10.	Switch plate on/off	07694
11.	Supply cord, 5-foot	
	120-Volt AC w/twist lock connector	02216
	12-Volt DC w/lo-profile connector	10833

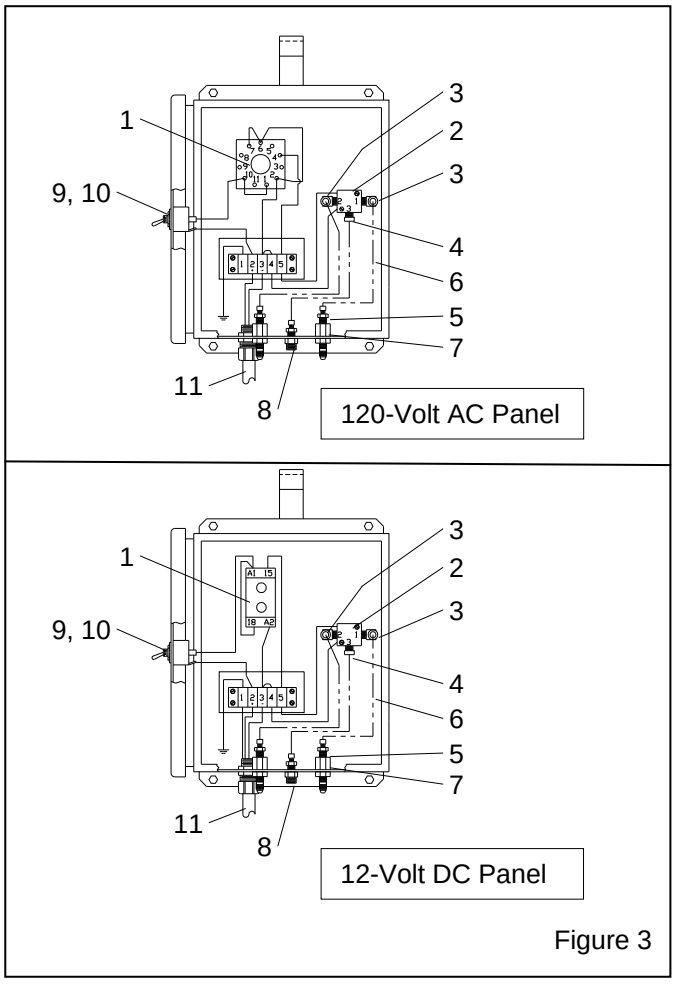


Figure 3

6.4 Inlet Valve, CA/CAD Cycle Timer, Figure 4

Item	Description	Stock No.
(-)	Inlet valve, CA/CAD cycle timer w/filter	04111
1.	Petcock 1/4" NPT	01993
2.	Elbow, 1/8" NPT adaptor	02827
3.	Nipple, 1/8" brass hex	01962
4.	Tee, 1/8" NPT brass	02171
5.	Bottom cap	01985
6.*	Spring, 5/8" x 1-11/16" long (1)	01982
7.*	Seal, bottom cap (1)	01989
8.	Valve plug	01984
9.	Valve body	01981
10.*	Washer, valve plug (2)	01969
11.*	Retainer, valve plug washer (1)	01986
12.*	O-Ring 3/16" ID x 1/16" (1)	01992
13.	Piston and rod assembly	01987
14.*	O-Ring 1-3/4" OD (1)	01990
15.	Cylinder cap	01983
16.	Filter, 1/8" NPT, 20 micron	02545
(-)	Service kit, includes items marked *, quantities are shown in ( )	01929

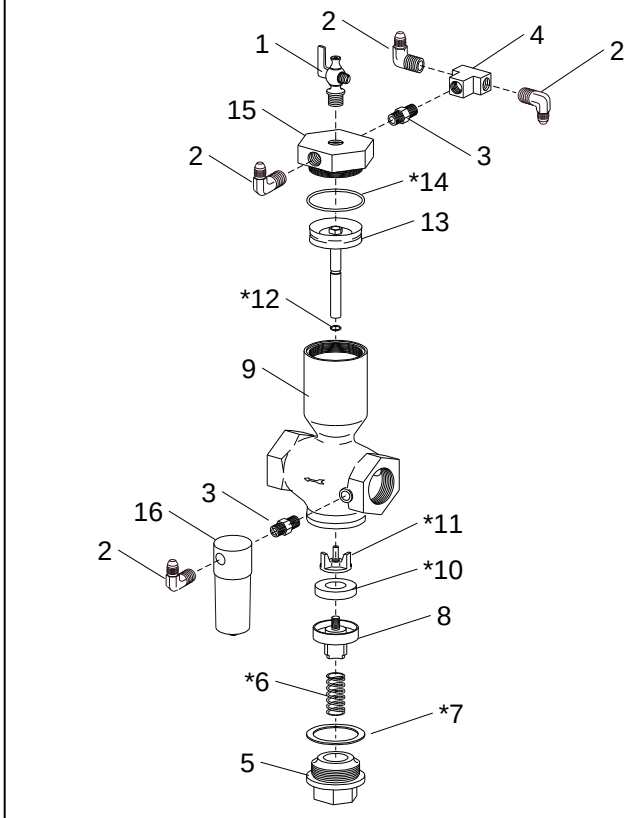


Figure 4

6.5 Abrasive Trap, Figure 5

Item	Description	Stock No.
(-)	Abrasive Trap, complete	02011
1.*	Screen (3)	02012
2.*	O-Ring (2)	02013
3.	Cap	02014
4.	Body	02015
5.	Lock bar	02016
6.	Screw, 3/8" NC x 1" thumb	03289
7.	Shoulder screw, 3/8" x 3/8"	03291
8.*	Gasket, screen, 1/8" thick (1)	02434
9.*	Decal, clean screen (1)	02129
(-)	Service kit, includes items marked *, quantities are shown in ( )	01925

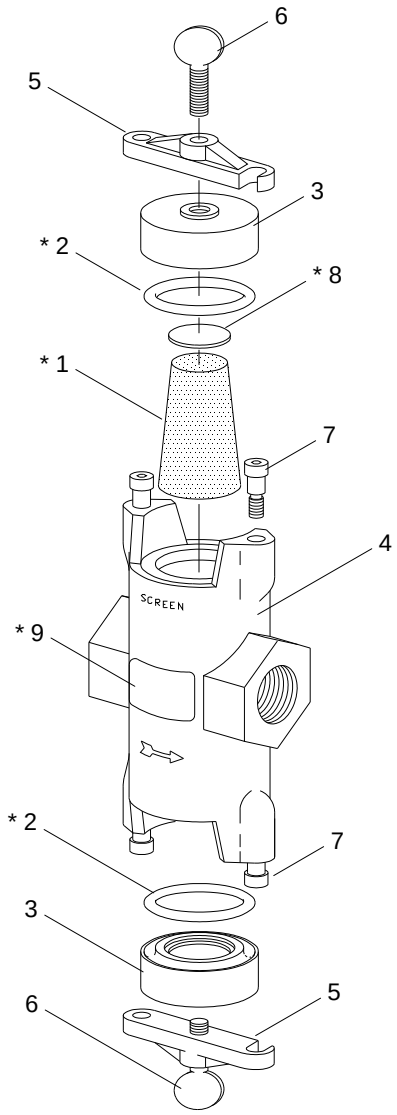


Figure 5

6.6 1" Diaphragm Outlet Valve Figure 6

Item	Description	Stock No.
(-)	1" Diaphragm Outlet Valve, complete	03371
1.	Nipple, 1" x close	01701
2.	Diaphragm	06149
3.	Washer, 1/4" lock	03117
4.	Cap screw, 1/4-NC x 1" HH	03053
5.	Cap, diaphragm outlet	03393
6.	Body, diaphragm outlet	06135
7.	Bushing, 1-1/4" x 1"	01804

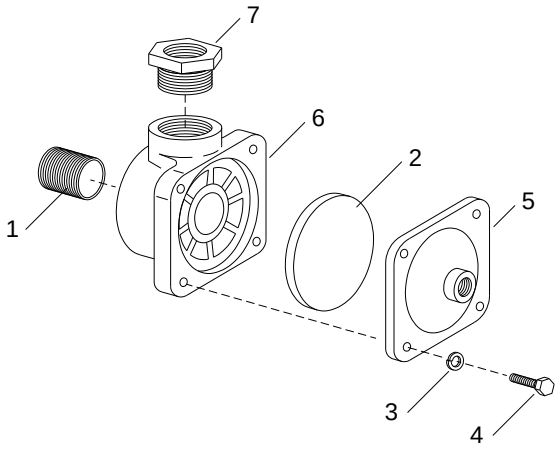


Figure 6